JOURNAL OF APPLIED BEHAVIOR ANALYSIS 1998, **31,** 287–290 NUMBER 2 (SUMMER 1998)

INCREASING COMPLIANCE WITH MEDICAL PROCEDURES: APPLICATION OF THE HIGH-PROBABILITY REQUEST PROCEDURE TO A TODDLER

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The effects of high-probability (high-*p*) requests on compliance with low-probability (low-*p*) responses have received increased attention from applied investigators. This study examined the effects of a high-*p* procedure on a toddler's compliance with medical procedures. Compliance to low-*p* requests occurred more frequently following compliance to high-*p* requests, suggesting that this procedure may be useful across different topographies of compliance.

DESCRIPTORS: high-probability requests, noncompliance, behavioral momentum, stimulus control, behavioral pediatrics

Recent studies on compliance have focused on the use of high-probability (high-*p*) requests to facilitate compliance to low-probability (low-*p*) requests. For example, Mace and Belfiore (1990) examined escape-maintained stereotypic responding of a woman with severe mental disabilities. Compliance to low-*p* requests, such as "Please hang up your coat," increased and stereotypic responding decreased when a high-*p* procedure was implemented immediately before delivery of the low-*p* request. Other applications of high-*p* procedures to daily living tasks and social interactions (e.g., Davis, Brady, Hamilton, McEvoy, & Williams, 1994) have resulted in similar success, although some investigations have demonstrated the procedures to be more effective when combined with extinction (e.g., Zarcone, Iwata, Mazaleski, & Smith, 1994). The purpose of this investigation was to extend the use of high-*p* procedures to compliance with medical procedures.

METHOD

Participants and Setting

Aaron was 22 months old and had been diagnosed with developmental delays and severe self-injurious behavior (SIB). He received ongoing treatment in a hospital for short-bowel syndrome. Due to his fragile medical condition, Aaron had never been away from the hospital for a period of more than 2 consecutive weeks since birth. At the time of this investigation, Aaron had undergone over 13 surgeries to lengthen and repair his bowel and to place and replace his central-venous line (c-line). He was referred for an evaluation of noncompliant behavior during c-line care; specifically, he routinely interfered with the daily cleaning procedures by turning away from his mother, touching his nonsterile arm to the sterile c-line site, kicking his feet, pulling out the c-line, and refusing to comply with requests to "hold still." All sessions were conducted in Aaron's crib in his hospital room.

Portions of this study were funded by a National Institute for Research in Developmental Disabilities grant.

The authors express their appreciation to the children and families who participated in this project, to Janet Drew and Kimberly Brown for their assistance in conducting sessions and for collecting interobserver agreement, and to Agnes DeRaad for her editorial expertise on an earlier version of the manuscript.

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Measurement and Design

Compliance with the low-*p* request, "Hold still," while Aaron's mother sterilized the c-line site served as the dependent measure. Compliance to the "hold still" request was defined as Aaron lying on his back without moving his torso or legs or touching the c-line for at least 5 s after the delivery of the low-*p* request. For each condition, the number of low-*p* requests to which Aaron complied were divided by the total number of low-*p* requests that were delivered and multiplied by 100%. The high-*p* requests involved simple, one-step requests that Aaron was informally observed to follow reliably during play activities. He complied with these high-*p* requests at least 80% of the time during intervention sessions. Data were collected by trained observers approximately three times per week over the course of 3 weeks. A combination 10-s partial-interval and event-recording system was used to record the delivery of the high-*p* and low-*p* requests (events), compliance (events), and presentation of social reinforcement (interval). Interobserver agreement checks were conducted during 40% of the sessions. Agreement coefficients were calculated on a point-by-point basis by dividing total number of agreements by the total number of agreements plus disagreements and multiplying by 100%. Agreement on compliance was 89% (range, 76% to 100%) and 100% for reinforcement delivered. Aaron's analysis was conducted using a multiple schedule design in which the treatments were implemented on a random basis. That is, within each session, about one half of the low-*p* requests (or trials) were preceded by a high-*p* sequence and the remaining half were not. Across all eight sessions, 38 low-*p* requests were delivered during differential reinforcement of alternative behavior with escape extinction (DRA/ESC EXT) and 36 low-*p* requests were delivered during the high-*p* treatment plus DRA and ESC EXT (HIGH-*P*/DRA/ESC EXT).

Procedure

Two treatment packages were implemented: DRA/ESC EXT and HIGH-*P*/DRA/ESC EXT. The procedures for the two packages were identical, with the exception that the latter involved the delivery of high-*p* requests prior to the low-*p* requests. Aaron's mother conducted all sessions, which lasted between 5 and 12 min, under direct supervision and with specific instructions from a therapist. A list of the steps performed to sterilize the c-line site are available from the first author. The number of steps (or trials) per session ranged from 7 to 11, depending on whether a step was repeated to ensure sterility. Prior to each step (or trial), Aaron's mother said, "Hold still." In both conditions, compliance with the low-*p* request resulted in praise while she quickly (within 30 s) completed the step and then played with him for approximately 5 s (DRA). If Aaron did not comply with the low-*p* request, the therapist held Aaron still until the step was completed (ESC EXT). During steps with the HIGH-*P*/DRA/ESC EXT condition in effect, a series of three to five high-*p* requests were delivered immediately prior to the low-*p* request. An example of a series of requests was, "'Touch your head, say 'Mom,' blow Mom a kiss, hold still." Compliance with each high-*p* request resulted in praise and delivery of the next request in the sequence. Noncompliance with a high-*p* request resulted in delivery of the next request in the sequence.

RESULTS AND DISCUSSION

Figure 1 shows the levels of compliance with low-*p* requests that were and were not preceded by a high-*p* sequence during each session. The mean levels of compliance were 44% and 78% for DRA/ESC EXT and

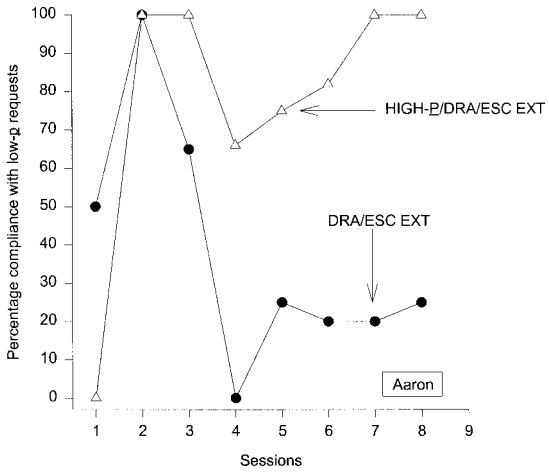

Figure 1. Percentage compliance to low-*p* requests with and without high-*p* treatment. Triangles represent compliance with low-*p* requests with differential reinforcement of alternative behavior with escape extinction (HIGH-*P*/DRA/ESC EXT), and closed circles represent compliance with low-*p* requests with high-*p* treatment plus DRA and ESC EXT (HIGH-*P*/DRA/ESC EXT).

HIGH-*P*/DRA/ESC EXT, respectively. In addition, the differences between the two treatments increased over time, indicating that the high-*p* requests substantially increased the level of compliance above that obtained through differential reinforcement and extinction. This is a potentially important finding because previous research has suggested that escape extinction may be a more important treatment component than high-*p* requests when compliance covaries inversely with a competing response (e.g., SIB) that is maintained by negative reinforcement (e.g., Zarcone et al., 1994). In the current investigation, Aaron displayed a number of responses that were incompatible with compliance (e.g., turning away, kicking his feet, pulling out the c-line). In fact, in this investigation, compliance was defined as the absence of these and other responses that interfered with the c-line procedure. Although the function of these competing responses was not formally assessed, they were probably maintained by escape from the c-line procedure. Thus, the current findings suggest that high-*p* requests may sometimes increase compliance even when there are competing responses maintained by negative reinforcement.

One explanation for these findings may be the increased rate of responding and the overall amount of reinforcement delivered contingent on compliance during the high-*p* treatment condition. That is, if Aaron was generally compliant with the high-*p* requests and was praised for each compliant response, then the general rate of compliance was high and more frequent reinforcement was provided in the HIGH-*P*/DRA/ESC EXT condition than in DRA/ESC EXT condition. This increase in the response–reinforcer relation (compliance–praise) may have led to an increase in the likelihood of compliance with the subsequent low-*p* request (see Mace & Belfiore, 1990).

The results of this investigation suggest that the high-*p* procedure was effective for increasing a topography of compliance that involved a potentially life-threatening behavior (infecting or pulling a c-line out of the heart). Because of the nature of the target response, escape extinction was a necessary component of the procedure; however, the results demonstrated the differential effects of the high-*p* requests on compliance with the procedure. One purpose of presenting these results is to show that a high-*p* treatment package is effective with a toddler and with a response topography (e.g., compliance in the form of holding still) that has not been evaluated in previous studies. This type of clinical replication is important for further establishing the robustness of the procedures, thus adding another applied procedure to our repertoire of interventions for increasing compliance.

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Received June 9, 1997
Initial editorial decision July 25, 1997
Final acceptance December 19, 1997
Action Editor, Wayne W. Fisher